Educational Goals and Objectives

Year 1 Introductory General Surgery Goals and Objectives

Timeframe: 6 months at the Bronx Veterans Administration Hospital

The general surgery service at the 311 bed Bronx Veterans Administration Hospital admits patients with general, endocrine, thoracic and oncology surgical problems, from a comorbid patient population. Residents are exposed to the spectrum of general surgical conditions, and learn the fundamental principals of surgical practice through attending supervised practice and a closely integrated didactic program.

At the completion of the Introductory General Surgical Rotation, the cardiothoracic resident will have obtained the following goals and objectives:

- **Patient Care**

  1. The resident should demonstrate an understanding of the principals of pre- and postoperative care of surgical patients by being able to:
     a. Write and present an accurate and concise history and physical examination of all organ systems
     b. Formulate an appropriate differential diagnosis, or problem list
     c. Order and interpret appropriate diagnostic studies
     d. Understand and manage a wide variety of common and/or important surgical problems and medical co-morbidities; risk assess and optimize patients pre-operatively, including:
        - **Cardiovascular**: Optimize cardiac and vascular function, assess cardiac risk including need for non-invasive and invasive testing, recognize and manage ischemic heart disease, stroke, hypertension, hypercholesterolaemia, dysrhythmias, heart failure, peripheral vascular disease including acute limb and enteric ischemia, valvular heart disease and deep venous thrombosis
        - **Pulmonary**: Optimize pulmonary function including smoking cessation, assess pulmonary risk including need for and interpretation of non-invasive and invasive testing, recognize and treat COPD, asthma, pneumonia, pulmonary embolism, pneumothorax, empyema and pulmonary edema.
- **Renal**: Optimize renal function, minimize risk of drug induced and contrast nephropathy, assess risk of acute and chronic renal failure, recognize and manage renal dysfunction

- **Hematology**: Optimize coagulation and anemia, diagnose and manage coagulation and bleeding disorders, select and interpret hematological investigations

- **Gastrointestinal**: Optimize nutrition, including dietary modification, enteral and parenteral nutrition; diagnose and treat common and important medical and surgical gastrointestinal symptoms and pathology, optimize hepatobiliary function, assess risk of, recognize and manage hepatobiliary dysfunction

- **Neurological and musculoskeletal**: Optimize cognition, pain control and independent function; assess the risk of, diagnose and treat stroke, confusion, dementia, falls, compartment syndromes, fractures.

- **Endocrine**: peri-operative management of diabetes mellitus, thyroid disorders, steroid management and adrenal axis disorders

- **Pharmacology**: review pre-operative medication and formulate an individualized perioperative plan based on comorbidity and planned surgery.
  
  e. Assess co-morbidities to determine surgical risk
  
  f. Work closely with anesthesia to effectively manage comorbidity, and optimize organ function and analgesia perioperatively
  
  g. Demonstrate adherence to informed consent and the universal protocol

2. The resident will begin to master surgical skills by:
   
   a. Gaining basic competency in use of surgical instruments, sutures, including surgical knots, anastomotic and stapling devices
   
   b. Performing procedures commensurate with their ability
      
      i. e.g. excision of soft tissue masses, venous access procedures, opening and closing common surgical incisions and practicing principals of tissue handling, hemostasis and antisepsis
   
   c. Obtaining the technical skill to safely place a tracheostomy both electively and emergently.
   
   d. Assisting attending surgeons and senior residents in the performance of operations, performing increasingly complex procedures under supervision, such as appendicectomy, hernia repair, removal or biopsy of superficial masses
e. Opening and closing abdominal incisions.
f. Learning to perform rigid sigmoidoscopy, flexible sigmoidoscopy, 
and various anorectal procedures.
g. Understanding team working in the operating room, operating room 
protocols, and use of equipment including cautery and laparoscopic 
systems.

**Medical Knowledge**

The resident will acquire the prerequisite knowledge and understanding of the 
pathophysiology, diagnosis and management of common and important 
general surgical conditions and by the end of this rotation should be able to:

a. Demonstrate a sound practical and theoretical understanding of fluid 
and electrolyte management, acid-base problems, nutrition, nausea 
and vomiting, analgesia, bleeding, sepsis and antisepsis, principals of 
local and regional anesthesia and transfusion management.
b. Know the uses, side effects, interactions and contraindications of 
commonly used drugs
c. Assess and provide proper care for wounds
d. Understand airway management
e. Understand the principals of critical care, and management of surgical 
emergencies, trauma and shock
f. Gain a basic practical and theoretical knowledge of recognition and 
effective resuscitation of the critically ill surgical patient
g. Demonstrate a comprehensive understanding of the anatomy and 
physiology of abdominal and pelvic structures as well as the pathology, 
presentation and management of diseases affecting those structures 
particularly mesenteric ischemia, ileus, small and large bowel 
obstruction and peptic ulcer disease.
h. Demonstrate a comprehensive understanding of the anatomy, 
physiology and pathophysiology of the thyroid, parathyroid, pituitary, 
hypothalamus, gonads, adrenal gland and the endocrine function of 
the pancreas and GI tract.
i. Know the symptoms, signs and diagnostic procedures necessary to 
diagnose colorectal problems, as well as principals of management
j. Understand the interpretation of plain radiography, ultrasound, contrast 
studies, computerized tomography, angiography, functional studies, 
cytology and histology of the esophagus, small bowel, colon and 
rectum
k. Evaluate and initiate management of abdominal wound problems, 
including infection, abscesses, dehiscence, fasciitis and 
enterocutaneous fistulae
l. Understand and interpret key diagnostic tests of endocrine function, 
including ultrasound, computerized tomography, radioisotope imaging, 
chemical pathology, cytology and histology
m. Demonstrate knowledge of the perioperative management of common or important endocrine conditions, including thyroid disease, diabetes mellitus, adrenal suppression, and syndrome of inappropriate antidiuretic hormone secretion.

n. Know the principals of perioperative management of patients with functional tumors of the endocrine system including carcinoid tumors, small cell lung cancer and pheochromocytoma

o. Understand the indications for and the principals of care of tracheostomies and the indications and technique for decannulation.

p. Acquire a basic understanding of critical appraisal of the literature and evidenced based practice.

q. Understand the principals of informed consent, patient confidentiality, and the universal protocol

• **Practice Based Learning & Improvement**

The resident will:

a. Adhere to the Thoracic Surgery Directors Association (TSDA) weekly Prerequisite Curriculum Readings

b. Learn to maintain an accurate logbook of procedures and outcomes

c. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.

d. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.

e. Actively participate in clinical audit to examine practice patterns in the institution.

• **Interpersonal & Communication Skills**

The resident will:

a. Gain basic skills in communicating effectively with patients and their families, hospital staff and outside agencies where appropriate regarding all aspects of surgical care

b. Participate actively in the process of obtaining informed consent.

c. Interact with hospital staff, peers and attending in a collegial, professional manner.

d. Participate in discussions and resolution of ethical issues that affect patient care

e. Attend and participate in Departmental and team conferences with an aim to developing skills in public speaking.

• **Professionalism**

The resident will:
a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

- Systems Based Practice

The resident will:

a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
d. Learn the basics of coding for diagnoses and services.
e. Learn how to arrange for elective and emergent surgeries, tests and admissions.

Year 1 Introductory Vascular Surgery Goals and Objectives

Timeframe: 4 months in Year 1 at the Bronx Veterans Administration Hospital

Nearly 300 major reconstructive cases are done at the Bronx VA hospital, including endovascular approaches to peripheral vascular disease including angiography and stent-angioplasty in addition to the more traditional open surgical procedures including peripheral revascularization and carotid endarterectomy.

- Patient Care

1. The resident should demonstrate an understanding of the principals of pre- and postoperative care of surgical patients by being able to:

a. Write and present an accurate and concise history and physical examination of the cardiovascular system
b. Formulate an appropriate differential diagnosis, or problem list
c. Order and interpret appropriate diagnostic studies, including vascular ultrasound, angiography, computer tomography and echocardiography
d. Manage a wide variety of common and/or important surgical problems and medical co-morbidities affecting the cardiovascular system

e. Risk assess and optimize patients pre-operatively, including optimizing cardiac and vascular function, assessing cardiac risk including need for non-invasive and invasive testing, recognize and manage ischemic heart disease, stroke, hypertension, hypercholesterolemia, dysrhythmias, heart failure, peripheral vascular disease including acute limb and enteric ischemia, valvular heart disease and deep venous thrombosis

f. Demonstrate responsibility for the care of inpatients on the vascular service, with attending supervision.

g. Demonstrate appropriate initial evaluation of outpatients with vascular disease including plans for initial diagnostic evaluation and therapeutic management

2. The resident will begin to master surgical skills by:

a. Consolidating skills in use of surgical instruments and sutures, focusing on principals of vascular tissue handling, vascular anastomosis and conduit harvest.

b. Demonstrate the technical skills required to perform basic surgical procedures under supervision including amputation, varicose vein excision and femoral artery exposure, arteriovenous access procedures, vein graft anastomosis, carotid artery exposure and assistance on abdominal vascular operations.

c. Demonstrate proficiency in placing percutaneous arterial and peripheral and central venous catheters.

• Medical Knowledge

1. The resident should demonstrate an understanding of the principals of pre- and postoperative care of surgical patients by being able to:

a. Adhere to the Thoracic Surgery Directors Association (TSDA) weekly Prerequisite Curriculum Readings

b. Know the symptoms, signs and diagnostic procedures necessary to diagnose vascular problems

c. Understand the interpretation of non-invasive and invasive pressure measurements, plain radiography, ultrasound, computerized tomography, angiography, venography, and histology of the vascular system.

d. Acquire a comprehensive knowledge of the principals of management of common or important disorders of the vascular system particularly peripheral ischemia, carotid artery stenosis, and deep venous thrombosis.
e. Demonstrate effective patient history taking and physical examination of the vascular system
f. Present pertinent patient information on rounds and in conferences.
g. Gain a basic understanding of the indications and contraindications to percutaneous approaches to vascular pathology, as well as transcatheter techniques

• **Practice Based Learning & Improvement**

The resident will:

a. Adhere to the Thoracic Surgery Directors Association (TSDA) weekly Prerequisite Curriculum Readings
b. Maintain an accurate and up-to-date logbook of procedures and outcomes
c. Continue to develop skills in critical appraisal of the literature
d. Attend and actively participate in department and team conferences
e. Design, complete and present one clinical audit

• **Interpersonal & Communication Skills**

The resident will:

a. Gain basic skills in communicating effectively with patients and their families, hospital staff and outside agencies where appropriate regarding all aspects of surgical care
b. Participate actively in the process of obtaining informed consent.
c. Interact with all colleagues in a professional manner.
d. Participate in discussions and resolution of ethical issues that affect patient care
e. Attend and participate in Departmental and team conferences with an aim to developing skills in public speaking.

• **Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

• **Systems Based Practice**

The resident will:

a. Understand and practice high quality, cost effective patient care.

b. Choose appropriate treatment options for patients based on risk-benefit analysis.

c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.

d. Learn the basics of coding for diagnoses and services.

e. Learn how to arrange for elective and emergent surgeries, tests and admissions.

**Year 1 Introductory Critical Care I Goals and Objectives**

Timeframe: 1 month in Year 1 at the Bronx VA hospital Coronary Care Unit

One month will be spent in a rotation on the coronary care unit. The aim of this rotation is to develop the foundation of key cardiology knowledge relevant to cardiac surgery practice, as well as a foundation in critical care skills and knowledge to enable residents to rapidly become functional team members during the Cardiothoracic Surgical Intensive Care Rotation in Year 2. At the end of this rotation the residents will have obtained the following goals and objectives:

• **Patient Care**

1. The resident should demonstrate an understanding of the principals of critical care of patients with cardiovascular problems by being able to:

   a. Round with the critical care attendings, maintaining an accurate list of patients, diagnoses and management plans
   
   b. Write and present an accurate and concise history of coronary care patients, including a précis of relevant investigations
   
   c. Conduct, document and present a detailed assessment of the patient including a systematic review of the critical care flowsheet and thorough physical examination, including a detailed assessment of the cardiovascular system
   
   d. Formulate an appropriate problem list and management plan
   
   e. Order and interpret appropriate diagnostic studies
   
   f. Demonstrate an ability to accurately assess and initiate appropriate emergency resuscitation in acutely decompensated patients
g. Understand, diagnose and manage a wide variety of common and/or important coronary care problems, including:
   a. Cardiac arrhythmias (atrial flutter and fibrillation, supraventricular tachycardias, ventricular arrhythmias, heart block, pacing problems)
   b. Congestive heart failure
   c. Valve disease including bacterial endocarditis
   d. Coronary artery disease and acute coronary syndromes including STEMI and NSTEMI
   e. Pulmonary oedema,
   f. Pulmonary embolism
   g. Stroke
   h. Pericardial tamponade

2. The resident will begin to master critical care skills by:
   a. Completing an Advanced Cardiac Life Support provider course
   b. Gaining basic proficiency in central venous, pulmonary artery and peripheral arterial cannulation.
   c. Consolidate skills in peripheral venous cannulation and arterial blood gas sampling.
   d. Gain proficiency in insertion of urinary, rectal and nasogastric catheters.
   e. Gaining basic proficiency in endotracheal intubation, as well as manual bag-and-mask ventilation.
   f. Acquiring proficiency in defibrillation and D.C. cardioversion.
   g. Assist insertion of intra-aortic balloon pump devices, transvenous pacing wires and pericardiocentesis.
   h. Performing tube thoracentesis and needle aspiration.

- **Medical Knowledge**

As part of this service the cardiothoracic resident is expected to:

   a. Complete the Thoracic Surgery Directors Association (TSDA) weekly Prerequisite Curriculum Readings.
   b. Display comprehensive understanding of the indications for admission to and discharge from critical care.
   c. Demonstrate comprehensive knowledge of pathophysiology, diagnosis and management of coronary artery and valvular heart disease, acute myocardial infarction, pulmonary oedema, bacterial endocarditis, congestive heart failure, tachy and brady-arrhythmias, pulmonary embolism.
   d. Acquire thorough understanding of EKG, blood gas, and chest X-ray interpretation in the coronary care setting.
e. Gain basic knowledge of transesophageal and transthoracic echocardiography.

f. Learn basic concepts of invasive monitoring including indications for, interpretation of and troubleshooting central venous pressure, arterial and pulmonary artery pressure measurement.

g. Gain comprehensive knowledge of indications for, management and complications of vasoactive medications including pressor, inotropes and antihypertensives, and antiarrhythmics.

h. Gain basic understanding of indications for, management and complications of invasive and non-invasive respiratory support and ventilation.

i. Acquire basic understanding of indications for and principals of intra-aortic counter pulsation.

• **Practice Based Learning & Improvement**

The resident will:

a. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.

b. Attend and actively participate in department and team conferences.

c. Actively participate, as feasible, in retrospective studies to examine practice patterns in the institution.

• **Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.

b. Participate actively in the process of obtaining informed consent.

c. Inform patients and families of the risks and benefits of procedure.

d. Interact with hospital staff, peers and attending in a collegial, professional manner.

e. Actively participate in the education of medical student and junior residents.

f. Participate in discussions and resolution of ethical issues that affect patient care.

g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.

• **Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

- **Systems Based Practice**

The resident will:

a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
d. Learn the basics of coding for diagnoses and services.
e. Learn how to facilitate patient and bed-flow.

**Year 1 Introductory Critical Care II Goals and Objectives**

Timeframe: 1 month in Year 1 at the Bronx VA hospital Intensive Care Unit

One month will be spent in a rotation in the 12 bed intensive care unit. The aim of this rotation is to develop the foundation of critical care skills and knowledge to enable residents to rapidly become functional team members during the Cardiothoracic Surgical Intensive Care Rotation in Year 2. At the end of this rotation the residents will have obtained the following goals and objectives:

- **Patient Care**

1. The resident should demonstrate an understanding of the principals of critical care of surgical patients and cardiac critical care by being able to:

   a. Round with the critical care attendings, maintaining an accurate list of patients, diagnoses and management plans.
b. Write and present an accurate and concise history of critical care patients, including a précis of relevant investigations.
c. Conduct, document and present a detailed assessment of the patient including a systematic review of the critical care flowsheet and thorough physical examination.
d. Formulate an appropriate problem list and management plan.
e. Order and interpret appropriate diagnostic studies.
f. Demonstrate an ability to accurately assess and initiate appropriate emergency resuscitation in acutely decompensated patients.
g. Understand and manage a wide variety of common and/or important critical care problems, including:
   a. Sepsis
   b. Multi-organ dysfunction
   c. Renal failure, fluid balance and electrolyte disorders
   d. Respiratory failure
   e. Pulmonary embolism
   f. Stroke
   g. End-organ ischemia

2. The resident will begin to master critical care skills by:
   a. Completing an Advanced Cardiac Life Support provider course.
   b. Gaining basic proficiency in central venous, pulmonary artery and peripheral arterial cannulation.
   c. Consolidate skills in peripheral venous cannulation and arterial blood gas sampling.
   d. Gain proficiency in insertion of urinary, rectal and nasogastric catheters.
   e. Gaining basic proficiency in endotracheal intubation, as well as manual bag-and-mask ventilation.
   f. Acquiring proficiency in defibrillation and D.C. cardioversion.
   g. Assist insertion of intra-aortic balloon pump devices, transvenous pacing wires and pericardiocentesis.
   h. Performing tube thoracentesis and needle aspiration.

• **Medical Knowledge**

As part of this service the cardiothoracic resident is expected to:

a. Complete the Thoracic Surgery Directors Association (TSDA) weekly Prerequisite Curriculum Readings.
   b. Display comprehensive understanding of the indications for admission to and discharge from critical care.
   c. Demonstrate comprehensive knowledge of pathophysiology, diagnosis and management of acute myocardial infarction, pulmonary oedema, bacterial endocarditis, congestive heart failure, tachy and brady-arrhythmias, pulmonary embolism, post-operative respiratory failure, acute renal failure, systemic inflammatory response syndrome, multi-organ dysfunction, acute respiratory distress syndrome, stroke and end-organ ischemia.
   d. Acquire thorough understanding of EKG, blood gas, and chest X-ray interpretation in the critical care setting.
e. Gain basic knowledge of transesophageal and transthoracic echocardiography.
f. Learn basic concepts of invasive monitoring including indications for, interpretation of and troubleshooting central venous pressure, arterial and pulmonary artery pressure measurement.
g. Gain comprehensive knowledge of indications for, management and complications of vasoactive medications including pressor, inotropes and antihypertensives.
h. Gain basic understanding of indications for, management and complications of invasive and non-invasive respiratory support and ventilation.
i. Acquire basic understanding of indications for and principals of intra-aortic counter pulsation, and renal replacement therapy.

• Practice Based Learning & Improvement

The resident will:

a. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.
b. Attend and actively participate in department and team conferences.
c. Actively participate, as feasible, in retrospective studies to examine practice patterns in the institution.

• Interpersonal & Communication Skills

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.
b. Participate actively in the process of obtaining informed consent.
c. Inform patients and their families of the risks and benefits of the procedure.
d. Interact with hospital staff, peers and attending in a collegial, professional manner.
e. Actively participate in the education of medical student and junior residents.
f. Participate in discussions and resolution of ethical issues that affect patient care.
g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.

• Professionalism
The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

• Systems Based Practice

The resident will:

a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
d. Learn the basics of coding for diagnoses and services.
e. Learn how to facilitate patient and bed-flow.

Year 2: Cardiothoracic Surgical Intensive Care Goals and Objectives

Timeframe: 3 months in Year 2
This time will be spent as a three-month rotation in the service described below:

The Cardiothoracic Surgery Intensive Care Unit currently has 34 beds including 12 acute cardiothoracic surgery ICU beds, 6 – 10 beds for longer term patients requiring cardiothoracic ICU, 6 PICU beds and 4 thoracic ICU beds on 7W. There is a full time faculty of 5 cardiothoracic intensivists, with 1 -2 anesthesia fellows rotating through at any given time.

The aim of this three month rotation is to consolidate the skills and knowledge acquired in the Introductory Critical Care Rotation in Year 1, and develop skills specific to the effective perioperative management of cardiothoracic patients.

• Patient Care
1. The resident should demonstrate an understanding of the principals of critical care of surgical patients and cardiac critical care by being able to:

a. Join attending and resident staff in contributing to daily rounds which include case discussions, bedside teaching of physical examination, and review of active pharmacotherapy and synthesis of relevant laboratory, noninvasive and invasive medical data.
b. Participate in medical order writing and all procedures performed in the unit with appropriate supervision according to their skill levels.
c. Learn how to manage critically ill patients and understand the interrelationship and problems of the various organ systems during the patient’s stay in the ICU.
d. Use the common medications used in an ICU setting including: vasopressors, antiarrhythmics, inotropes, diuretics, antibiotics, anti-hypertensives.
e. Learn the principles of nutritional support, both enteral and parenteral.
f. Monitor and manage various problems of the cardiac system and circulation with particular reference to post-cardiotomy patients, including cardiac arrest, and emergency resternotomy.
g. Gain proficiency in hemodynamic monitoring and advanced management of hemodynamic problems including transcutaneous and epicardial pacing.
h. Manage the airway and respiratory conditions of critically ill patients. (The staff of the ICU includes trained anesthesiologists who teach the residents the principles and the techniques of intubation and airway management.)
i. Learn to assess pulmonary function, pulmonary function tests, and respirator management including learning to augment support effectively and how to wean patients from ventilators.
j. Provide initial assessment and management of respiratory failure and acute respiratory distress syndrome.
k. Learn to manage disorders of fluid and electrolytes as well as acid-base disorders.
l. Manage acute and chronic renal insufficiency and acute and chronic dialysis.
m. Gain basic proficiency in the management of and the methods of placement of central venous catheters, arterial lines, Swan-Ganz catheters, pulse oximetry, and end tidal carbon dioxide monitors.
n. Acquire proficiency in the performance of tracheostomies and bronchoscopies.
o. Understand the principles of and indications for echocardiography
p. Be able to recognize, assess and provide initial management of miscellaneous problems of other organ systems as they arise, including the neurological system (seizures, coma, disorientation), gastrointestinal (stress bleeding, etc.) hepatic (liver failure, and portal hypertension) and hematological (bleeding and clotting abnormalities)
2. The resident will develop competency in core cardiothoracic ICU skills by:

a. Participating in emergency resuscitation including emergency resternotomy for tamponade or bleeding on the ICU and in the OR.
b. Gaining proficiency in peripheral venous cannulation and arterial blood gas sampling; central venous, pulmonary artery and peripheral arterial cannulation.
c. Assisting bedside tracheostomy placement and performing bronchoscopy.
d. Gaining proficiency in endotracheal intubation, as well as manual bag-and-mask ventilation.
e. Acquiring proficiency in defibrillation and D.C. cardioversion.
f. Performing insertion of intra-aortic balloon pump devices.
g. Performing tube thoracentesis and needle aspiration.

- Medical Knowledge

As part of this service the cardiothoracic resident is expected to:

a. Adhere to the Thoracic Surgery Directors Association (TSDA) weekly Requisite Curriculum Readings.
b. Demonstrate a detailed knowledge of the basic sciences underpinning the cardiovascular and respiratory systems.
c. Display a comprehensive knowledge of the pathophysiology of the central nervous, renal, gastrointestinal, endocrine and immune systems relevant to critical care.
d. Acquire familiarity with the perioperative assessment and management of the following commonly occurring conditions:
   a. Coronary artery disease
   b. Valvular heart disease
   c. Lung and esophageal cancer
   d. Diseases of the pleura
   e. Understanding of the principles and consequences of cardiopulmonary bypass
   f. Bleeding
g. Tamponade
h. Respiratory failure
i. Sepsis
j. Renal failure
k. Major gastrointestinal complications
l. Stroke
m. Coagulopathy

- Practice Based Learning & Improvement
The resident will:

a. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.
b. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.
c. Actively participate, as feasible, in retrospective studies to examine practice patterns in the institution.

- **Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.
b. Participate actively in the process of obtaining informed consent.
c. Inform patients and their families of the risks and benefits of the procedure.
d. Interact with hospital staff, peers and attending in a collegial, professional manner.
e. Actively participate in the education of medical student and junior residents.
f. Participate in discussions and resolution of ethical issues that affect patient care.
g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.

- **Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

- **Systems Based Practice**

The resident will:

a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
d. Learn the basics of coding for diagnoses and services.
e. Learn how to facilitate patient and bed-flow.

Year 2 Core Surgery Goals and Objectives

Timeframe: 6 months in Year 2 on the Thoracic Surgery Services at The Mount Sinai Medical Center

The Thoracic Surgery Services at The Mount Sinai Medical Center covers the full spectrum of lung, mediastinal, and upper gastrointestinal surgery. Over 600 major thoracic procedures were carried out last year and all our residents have met their ABTS case requirements early during their thoracic rotations. There is a faculty of 5 thoracic surgeons and the department is currently recruiting a new Chief of Thoracic Surgery with the aim of further increasing case-mix and volume.

During this introductory 6 month rotation the cardiothoracic resident will function as the thoracic resident. They will usually be the sole ACGME resident on the thoracic service during this time, unless the 6th year ACGME resident elects to spend their final months in an advanced elective on the service. In this way they will have unrestricted exposure to a wide range of core surgical conditions and procedures, and start to acquire skills required to organize a clinical service.

- **Patient Care**
  1. The resident should demonstrate an understanding of the principals of routine and critical care of surgical patients by being able to demonstrate competency in:

a. Patient selection and determination of suitability for major surgery and the pre and postoperative management of thoracic surgical patients.
b. Caring for complex critically ill thoracic patients including hemodynamic, respiratory and enteral management.
c. The assessment and management of lung, and esophageal cancer, including the scientific basis of staging systems and techniques used in the determination of stage and fitness for surgery, and an understanding of the role of surgical treatment in the multidisciplinary management of intrathoracic malignant diseases, including an appreciation of the principles of other treatment modalities and their outcomes.
d. The assessment and management of patients with pleural disease; including pneumothorax and empyema, and including both VATS and open strategies.
e. The assessment and management of patients with chest wall abnormalities, infections and tumours.
f. The assessment and management of patients disorders of the diaphragm, including trauma to the diaphragm.
g. The assessment and management of patients with emphysematous and bullous lung disease; including surgical management if appropriate and utilizing both VATS and open strategies.
h. The assessment and management of patients with disorders of the esophagus; including surgical management if appropriate and utilising both VATS and open strategies.
i. The assessment and management of patients with disorders of the stomach; including surgical management if appropriate and utilising both VATS and open strategies.
j. The assessment and management of patients with disorders of the pericardium and pericardial cavity; including surgical management if appropriate and utilizing both VATS and open strategies.
k. The assessment and management of patients with mediastinal tumours and masses; including surgical management if appropriate and utilizing both VATS and open strategies.
l. The assessment and management of patients with disorders of the major airways, including operative management in suitable cases.

2. The resident will develop key skills in core surgery by the end of the rotation, demonstrating:

a. Basic competency in surgery for benign and malignant conditions of the lungs, including performing uncomplicated lobectomy for lung cancer, wedge resection and metastasectomy under supervision.
b. Intraoperative diagnosis and staging.
c. Open operation for uncomplicated pleural problems e.g. pneumothorax, effusion, haemothorax including drainage, biopsy, pleurodesis and pleurectomy.
d. Esophagoscopy and gastroscopy.
e. Bowel anastomotic techniques.
f. VATS procedures for uncomplicated pleural problems e.g. pneumothorax, effusion, hemothorax including drainage, biopsy, pleurodesis and pleurectomy.
g. Open and VATS procedures for empyema, including techniques for decortication.
h. Competence in performing appropriate thoracic incisions and laparotomy.
i. Proficiency in the assessment and management of a patient by bronchoscopy and esophagoscopy including foreign body retrieval.
• Medical Knowledge

By the end of this rotation the resident should be able to demonstrate:

a. In depth knowledge of the Thoracic Surgery Directors Association (TSDA) weekly Requisite Curriculum Readings.

b. Progressively acquire, under supervision, the operative skills to perform the full spectrum of general thoracic surgical procedures including endoscopy, thoracoscopic and open procedures of the lungs, pleura, chest wall, esophagus, mediastinum and diaphragm.

c. A detailed understanding of current consensus guideline indications for thoracic surgery and adjuncts including pharmacotherapeutic and adjuvant oncological interventions.

d. A solid knowledge base of the fundamental pathophysiologic and clinical processes underlying the diseases of the non-cardiovascular, thoracic organs, and upper gastrointestinal tract.

e. A comprehensive knowledge of normal and pathologic conditions of both thoracic and gastrointestinal structures including congenital and acquired lesions (including infections, trauma, tumors, and metabolic disorders) of both the heart and blood vessels in the thorax, as well as diseases involving the lungs, pleura, chest wall, mediastinum, esophagus, stomach and diaphragm.

f. A detailed understanding of diagnostic modalities in this field including conventional radiography, CT and MR scans, PET scans, ultrasonography, esophageal manometry and pH testing, pulmonary function tests, etc.

g. A comprehensive understanding of the selection and timing of operative intervention in thoracic disease focusing on an evidence-based approach using the most current literature.

h. A thorough understanding of the preoperative management of patients undergoing general thoracic surgical procedures such as optimization of cardiopulmonary status, oncologic staging, neoadjuvant therapy, etc.

i. Detailed knowledge of the physiologic basis of the spectrum of general thoracic surgical procedures.

j. A thorough understanding of the assessment and management of a patient by mediastinal exploration.

k. Understand the principles of post-operative care of patients undergoing general thoracic procedures including management of drains, post-operative imaging, oncologic surveillance, adjuvant therapy, etc. and management of post-operative complications.

• Practice Based Learning & Improvement
The resident will:

a. Maintain an up-to-date and accurate logbook of procedures and outcomes.
b. Conduct a publicable retrospective database analysis of thoracic surgical outcomes under supervision.
c. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.

- **Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.
b. Participate actively in the process of obtaining informed consent.
c. Inform patients and their families of the risks and benefits of the procedure.
d. Interact with hospital staff, peers and attending in a collegial, professional manner.
e. Actively participate in the education of medical student and junior residents.
f. Participate in discussions and resolution of ethical issues that affect patient care.
g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.

- **Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

- **Systems Based Practice**

The resident will:

a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
d. Learn the basics of coding for diagnoses and services.
e. Learn how to arrange for elective and emergent surgeries, tests and admissions.

Year 2 Introductory Adult Cardiac Surgery

Timeframe: 3 months at The Mount Sinai Medical Center in year 2

At the completion of the Introductory Adult Cardiac Surgery rotation, the cardiothoracic resident will have obtained the following goals and objectives:

• Patient Care

1. The resident should demonstrate basic proficiency in the pre and post-operative care of cardiothoracic surgical patients in both the in and out-patient setting, and operative management, displaying a practical understanding of:

   a. The management of critically ill cardiothoracic surgical patients in the pre and post operative periods.
b. The management of a patient undergoing cardiopulmonary bypass.
c. The management of myocardial protection during cardiac surgery.
d. The management of a patient requiring circulatory support.
e. The assessment and management of patients with coronary heart disease, including elective and emergency presentations. To include competence in both primary and secondary procedures, and where appropriate to include off pump and on pump strategies and arterial revascularization.
f. The preliminary assessment and initial management of patients with complications of myocardial infarction, including mitral regurgitation, aneurysm and septal defects. To include operative management in appropriate situations.
g. The assessment and management of patients with valvular heart disease; including both isolated and combined aortic and mitral valve disease.
h. The assessment and management of patients with combined coronary and valvular heart disease, including operative management.
i. The preliminary assessment and initial management of patients with acute dissection of the ascending aorta. To include operative management in appropriate situations.
j. The assessment and management of patients suitable for endovascular intervention on the thoracic aorta, with advanced endovascular skills to be developed in post-residency fellowship.

k. The assessment and management of end-stage heart failure, including basic competency in cardiac transplantation, ventricular assist device therapy, revascularization and valvular heart surgery in this setting.

l. The assessment and management of patients with cardiothoracic trauma.

2. The resident should be able to demonstrate proficiency in basic cardiothoracic surgical skills including:

   a. Suturing and knot tying with sutures commonly used in cardiac surgery.
   b. Principles of hemostasis.
   c. Open saphenous vein harvest.
   d. Anterior thoracotomy, median sternotomy.
   e. Aorto-caval cannulation.
   f. Sternal closure.

• **Medical Knowledge**

By the end of this rotation residents should be able to demonstrate:

a. Adherence to the Thoracic Surgery Directors Association (TSDA) weekly Requisite Curriculum Readings

b. A detailed understanding of current consensus guideline indications for cardiothoracic surgery and adjuncts including pharmacotherapeutic and percutaneous interventions.

c. A comprehensive knowledge of normal and pathologic conditions of both cardiovascular structures including congenital and acquired lesions (including infections, trauma, tumors, and metabolic disorders) of both the heart and blood vessels in the thorax.

d. Familiarity with diagnostic procedures such as cardiac catheterization, angiography, electrocardiography, echocardiography, and imaging techniques.

• **Practice Based Learning & Improvement**

The resident will:

a. Start a retrospective database clinical outcomes study, with the aim of completing it within 6 to 12 months.

b. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.
c. Actively participate, as feasible, in retrospective studies to examine practice patterns in the institution.

**Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.
b. Participate actively in the process of obtaining informed consent.
c. Inform patients and their families of the risks and benefits of the procedure.
d. Interact with hospital staff, peers and attending in a collegial, professional manner.
e. Actively participate in the education of medical student and junior residents.
f. Participate in discussions and resolution of ethical issues that affect patient care.
g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.

**Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

**Systems Based Practice**

The resident will:

a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
d. Learn the basics of coding for diagnoses and services.
e. Learn how to arrange for elective and emergent surgeries, tests and admissions.
f. Demonstrate the ability to formulate and implement a diagnostic and treatment plan for disease of the abdomen and pelvis that are amenable to laparoscopic intervention.
g. Understand the applications of laparoscopy in general and become familiar with the physiologic implications of laparoscopic surgery

**Year 3 Introductory Endovascular Surgery**
Timeframe: 6 months at The Mount Sinai Medical Center.

By the end of year 2 residents have selected whether they will be cardiac track or thoracic track. Cardiac track residents will complete this 6 month rotation in Endovascular Surgery at The Mount Sinai Medical Center.

Team VS1 and VS2 are the vascular surgery services at The Mount Sinai Hospital. Nearly 600 major reconstructive cases and more than 1600 total cases are done between the 2 services each year. VS1 performs the majority of stent-graft repairs of thoracic and abdominal aortic aneurysms done at the Mount Sinai Medical Center, in addition to the more traditional open surgical procedures including peripheral revascularization and carotid endarterectomy. VS2 also performs a wide range of vascular procedures in the operating room, including angiography and stent-angioplasty as well as open surgery.

Residents will function as an endovascular fellow, performing both diagnostic and interventional procedures, as well as some open procedures. This rotation has been designed to teach residents the catheter and guidewire skills essential to performing aortic endovascular surgery; and work within a multidisciplinary cross-specialty team.

At the completion of the endovascular rotation the cardiothoracic resident will have obtained the following goals and objectives:

- **Patient Care**

  The resident should demonstrate an understanding of the principals of pre- and postoperative care of endovascular patients demonstrating:

  a. Competency managing patients preoperatively and postoperatively including in the recovery room, and intensive care unit if needed.
  b. Increasing responsibility/participation in the endovascular suite, either as primary, first, or second assistant, demonstrating an ability to anticipate maneuvers, take direction well, and make reasonable suggestions.
  c. Ability to obtain venous and arterial access with seldinger technique, demonstrate competent guide wire skills, and placement of catheters under fluoroscopy.
d. Understanding the indications and feasibility for endovascular graft placement, including Type B dissections with malperfusion, thoracoabdominal aneurysms, and traumatic aortic injury.
e. Demonstrate the ability to measure and select appropriate size aortic endovascular graft.
f. Exposure and repair femoral artery; knowledge of alternative access sites for endovascular graft placement.
g. Demonstrate ability to introduce arterial introducer sheaths.
h. Knowledge of surgical plan for major vascular injury following endovascular graft placement/removal introducer sheath.
i. Familiarity with placement of renal, celiac, SMA, and iliac stents for persistent malperfusion s/p coverage of aortic dissection PIT.
j. Fluoroscopy skills including diagnostic angiography of major and peripheral vessels.

• Medical Knowledge

a. Anatomy, physiology, and pathology of the vascular system, including the thoracic and abdominal aorta, carotid, and peripheral vascular system.
b. Surgical diseases of the aorta, carotid and cerebral vessels, and peripheral vascular system, including atherosclerosis, aneurysm, dissection and vascular trauma.
c. The technology, interpretation, setup, and complications of angiography and fluoroscopy.
d. The principles of preoperative assessment and postoperative management of patients following interventional radiological procedures.

• Professionalism

a. The ability to communicate effectively with patients, their families, and other members of the health care team.
b. The ability to be honest, reliable and respectful of the religious, racial, and gender characteristics of patients, their families and other members of the health care team.
c. The ability to understand the psychological needs of the patient facing potentially life threatening disease and surgery.
d. The ability to give and receive advice in a manner that is consistent with the harmonious operation of a health care team.
e. An awareness of the medico-legal aspects of interventional radiology.
f. An appreciation of the ethical aspects of interventional radiology.
g. An understanding of the obligation of continuing self-education and of teaching others.

h. The ability to keep succinct, pertinent, and current medical records.

i. The ability to recognize when to seek assistance from more experienced colleagues.

j. The ability to appreciate the importance of acquiring and maintaining an appropriate professional attitude in order to practice in any specialty.

• *Interpersonal and Communication Skills*

a. Obtain and synthesize relevant history from patients and family.

b. Inform patients and families about their condition at an appropriate and understandable level.

c. Be sensitive and respond appropriately to issues of gender, culture, and ethnicity in dealing with patients and families.

d. Write clear consultation note/discharge summary/clinic note.

e. Prepare and present ward and ICU rounds in an organized manner.

f. Participate actively in scheduled rounds.

• *Systems-Based Practice*

a. Utilize resources effectively to balance patient care and learning needs.

b. Allocate finite health care resources wisely.

c. Understand the importance and mechanisms to safely utilize resources in a cost-effective manner to benefit all patients.

• *Practice-Based Learning and Improvement*

a. Develop, implement, and monitor a personal continuing education strategy.

b. Critically appraise sources of medical information.

c. Facilitate learning of patients, housestaff/students, and other health professionals.

d. Contribute to development of new knowledge.

e. Contribute knowledge learned to service rounds.

f. Understand principles and practice of basic and applied research including the scientific method, design and conduct of clinical trials, critical appraisal of literature, and the use of statistics.

g. Prepare and present scheduled rounds.

h. Participate actively in scheduled morbidity and mortality conferences.

i. Actively participate in journal club.
j. Prepare and present research papers in medical literature.
k. Participate effectively in teaching fellow professionals, including junior house staff.

**Year 3 Introductory Thoracoscopic Surgery**

Timeframe: 6 months at The Mount Sinai Medical Center.

By the end of year 2 residents have selected whether they will be cardiac track or thoracic track. Thoracic track residents will complete this 6 month rotation in Thoracoscopic Surgery at The Mount Sinai Medical Center.

The Division of Thoracic Surgery has particular expertise in thoracoscopic and laparoscopic surgery, performing over 750 thoracoscopic procedures a year. Residents will function as a thoracic fellow, rounding on all patients, attending clinic and assisting and performing thoracoscopic procedures. This rotation has been designed to build on the basic skills and knowledge of general thoracic surgery acquired in year 2. The focus is on teaching residents to perform simple thoracoscopic and laparoscopic procedures, to promote development of the thoracoscopic skills essential to performing more complex thoracic surgery such as VATS esophagectomy and lobectomy in their final year.

At the completion of the thoracoscopic rotation the cardiothoracic resident will have obtained the following goals and objectives:

- **Patient Care**

  The resident should demonstrate an understanding of the principals of pre- and postoperative care of general thoracic patients demonstrating:

  a. Competency managing patients preoperatively and postoperatively including in the recovery room, and intensive care unit if needed.
  b. Increasing responsibility/participation in thoracoscopic surgery, either as primary, first, or second assistant, demonstrating an ability to anticipate maneuvers, take direction well, and make reasonable suggestions.
  c. Ability to select approaches, plan optimal port placement, safely place ports, and trouble-shoot common access and visualization problems.
  d. Detailed understanding of the indications, contraindications, benefits and risks of thoracoscopic approaches.
  e. Ability to perform under supervision the following thoracoscopic procedures:
     a. Lung or pleural biopsy
     b. Wedge resection
c. Pleuradheses

d. Pleurectomy

e. Bullectomy

f. Mediastinocopy

g. Pericardial window

h. Diagnostic laparoscopy

i. Bronchoscopy

• Medical Knowledge

a. Anatomy, physiology, and pathology of pleural, pericardial and peritoneal spaces, lungs and bronchial tree, thoracic inlet and thoracic wall.

b. Surgical diseases of the thorax.

c. The technology, interpretation, setup, and complications of thoracoscopy, laparoscopy, bronchoscopy and mediastinoscopy.

d. The principles of preoperative assessment and postoperative management of patients following the above procedures.

• Professionalism

a. The ability to communicate effectively with patients, their families, and other members of the health care team.

b. The ability to be honest, reliable and respectful of the religious, racial, and gender characteristics of patients, their families and other members of the health care team.

c. The ability to understand the psychological needs of the patient facing potentially life threatening disease and surgery.

d. The ability to give and receive advice in a manner that is consistent with the harmonious operation of a health care team.

e. An understanding of the obligation of continuing self-education and of teaching others.

f. The ability to keep succinct, pertinent, and current medical records.

g. The ability to recognize when to seek assistance from more experienced colleagues.

h. The ability to appreciate the importance of acquiring and maintaining an appropriate professional attitude in order to practice in any specialty.
• **Interpersonal and Communication Skills**

a. Obtain and synthesize relevant history from patients and family.
b. Inform patients and families about their condition at an appropriate and understandable level.
c. Be sensitive and respond appropriately to issues of gender, culture, and ethnicity in dealing with patients and families.
d. Write clear consultation note/discharge summary/clinic note.
e. Prepare and present ward and ICU rounds in an organized manner.
f. Participate actively in scheduled rounds.

• **Systems-based Practice**

a. Utilize resources effectively to balance patient care and learning needs.
b. Allocate finite health care resources wisely.
c. Understand the importance and mechanisms to safely utilize resources in a cost-effective manner to benefit all patients.

• **Practice-Based Learning and Improvement**

a. Develop, implement, and monitor a personal continuing education strategy.
b. Critically appraise sources of medical information.
c. Facilitate learning of patients, house staff/students, and other health professionals.
d. Contribute to development of new knowledge.
e. Contribute knowledge learned to service rounds.
f. Understand principles and practice of basic and applied research including the scientific method, design and conduct of clinical trials, critical appraisal of literature, and the use of statistics.
g. Prepare and present scheduled rounds.
h. Participate actively in scheduled morbidity and mortality conferences.
i. Actively participate in journal club.
j. Prepare and present research papers in medical literature.
k. Participate effectively in teaching fellow professionals, including junior house staff.
Year 3 -4 Intermediate Adult Cardiac Surgery

Timeframe: 12 continuous months at The Mount Sinai Medical Center over years 3 to 4

The Intermediate Adult Cardiac Surgery rotation is designed to allow residents to consolidate their skills in adult cardiac surgery, as cardiothoracic surgery intensive care, for which they will take call during this year. Residents spend 12 months in adult cardiac surgery. The second year resident serves as the Senior Resident in Cardiac Surgery, assisting the Chief Resident in Cardiac Surgery in running the adult cardiac surgery service and participating in the intra- and post-operative care of patients on pediatric cardiac surgery services in collaboration with other members of that team including pediatric cardiology fellows and attendings. Clinical skills and responsibilities include:

At the completion of the Intermediate Adult Cardiac Surgery rotation the cardiothoracic resident should have developed sufficient skills, knowledge and experience to individualize perioperative patient management. The resident should demonstrate basic proficiency in the pre- and post-operative care of cardiothoracic surgical patients in both the in- and out-patient setting, and operative management, and will have obtained the following goals and objectives by the end of the rotation:

• Patient Care
  1. The resident should demonstrate basic proficiency in the pre- and post-operative care of cardiothoracic surgical patients in both the in- and out-patient setting, and operative management, displaying a proficiency in:

    a. Rounding on all patients on the adult cardiac surgery service - with primary responsibility for supervising the surgical care of the patients on the step-down unit.
    b. Formulating a care plan for each patient with the Chief Resident or attending surgeon and if appropriate with other physicians and consultants involved in the patient’s care. The resident has primary responsibility for all patient care decisions but works under the direct supervision of the attending surgeon.
    c. Assisting in the post-operative care of pediatric cardiac surgical patients.
    d. Reviewing, along with the other residents and fellows, preoperative patients (including imaging studies, functional
tests, etc.) with the attending surgeon and together develop a pre- and intra-operative plan.

e. Performing adult cardiac surgical consults under the supervision of the attending surgeon.
f. Managing independently pre- and post surgical patient on the critical care, high dependency and post operative wards. To work as part of a multi-professional, multidisciplinary team in the management of a patient requiring complex critical care. Competence in the management of uncomplicated situations should be achieved during this period. Management of complicated or difficult situations will require appropriate supervision and guidance.
g. Managing with supervision the clinical and technical aspects of cardiopulmonary bypass.
h. Managing with supervision the clinical and technical aspects of intraoperative myocardial protection.
i. Managing with supervision the clinical and technical aspects of circulatory support.
j. Evaluating and manage with appropriate supervision the surgical aspects of a patient with ischaemic heart disease including the complications of ischaemic heart disease; patients with valvular heart disease including aortovascular disease; and patients with thoracic trauma Proficiency in the assessment and management of the preoperative, postoperative and critically ill patient.
k. Advanced analysis and interpretation of investigations, including specific diagnostic tests.
l. Critical care management including recognition, evaluation and treatment of hemodynamic and ventilatory abnormalities.
m. Competency in the supervised management of multi-organ failure.
n. The management of chest trauma (ATLS).

2. The resident should be able to demonstrate proficiency in intermediate cardiothoracic surgical skills including:

a. Progressively acquire, under supervision, the operative skills to link the individual stages of common adult cardiac surgical procedures together so that the resident is performing basic cardiac operations as first surgeon.
b. Cannulation and institution of cardiopulmonary bypass, including bi-caval and axillary cannulation.
c. Weaning from bypass and decannulation.
d. Hemostasis including in reoperative patients.
e. Femoral cannulation and decannulation.
f. Mammary/radial artery harvest.
g. Preparation for, and management of, cardiopulmonary bypass.
h. Proximal aortovenous and distal coronary anastomosis.
i. Heart valve replacement.
j. Surgical re-exploration for bleeding or tamponade.
k. Basic catheter and guide wire OR endoscopic skills.
l. Primary coronary artery bypass grafting.
m. Aortic valve replacement.
n. Mitral valve replacement.
o. Tricuspid valve repair.
p. Atrial septal defect closure.
q. Coarctation resection.

• Medical Knowledge

By the end of this rotation residents should be able to demonstrate their ability to:

a. Acquire a comprehensive knowledge base of the fundamental pathophysiologic and clinical processes in adult and pediatric patients with cardiovascular disease.
b. Learn to review and interpret the specialist diagnostic modalities in this field including echocardiography, cardiac catheterization, nuclear imaging, CT and MR scans, etc.
c. Understand the selection and timing of operative intervention in adult and pediatric cardiovascular disease focusing on an evidence-based approach using the most current literature.
d. Understand the preoperative management of patients undergoing cardiovascular procedures such as optimization of heart failure patients and risk-stratification.
e. Understand the physiologic basis of the spectrum of adult and pediatric cardiovascular procedures including principles and practice of cardiopulmonary bypass.
f. Understand the pathophysiology, diagnosis and management complications of cardiac surgery including mediastinal bleeding, mediastinitis, sepsis, stroke, renal failure, gastrointestinal bleeding and ischemia, dysrhythmias, respiratory failure.
g. Consolidate detailed knowledge of the clinical features and advanced operative and medical management of the following commonly occurring cardiothoracic conditions:

1. Coronary artery disease
2. Valvular heart disease
3. Aortovascular disease
4. End stage heart failure
5. Principles and consequences of cardiopulmonary bypass, myocardial protection and circulatory support.

- **Practice Based Learning & Improvement**

The resident will:

a. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.

b. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.

c. Actively participate, as feasible, in retrospective studies to examine practice patterns in the institution.

- **Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.

b. Participate actively in the process of obtaining informed consent.

c. Inform patients and their families of the risks and benefits of the procedure.

d. Interact with hospital staff, peers and attending in a collegial, professional manner.

e. Actively participate in the education of medical student and junior residents.

f. Participate in discussions and resolution of ethical issues that affect patient care.

g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.

- **Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.

b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.

c. Develop a commitment to providing equal health care to all patients.

d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

- **Systems Based Practice**

The resident will:
a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
d. Learn the basics of coding for diagnoses and services.
e. Learn how to arrange for elective and emergent surgeries, tests and admissions.

**Year 4 Congenital Cardiac Surgery**

**Timeframe:** 6 months at The Mount Sinai Medical Center in year 4

The Congenital Cardiac Surgery rotation is designed to provide comprehensive education and training in the principals and practice of congenital cardiac surgery, while consolidating the clinical and operative cardiac surgical skills gained in the Intermediate Cardiac Surgery rotation. At the completion of the Congenital Cardiac Surgery rotation, the cardiothoracic resident will have obtained the following goals and objectives:

- **Patient Care**

  1. The resident should demonstrate proficiency in the pre- and postoperative care of congenital surgical patients in both the in and outpatient setting, and operative management including:

    a. Working as a member of a multi-disciplinary team in the perioperative management of complex congenital cardiac surgical patients.

    b. Initial assessment and management of common problems in the acute post-operative setting after congenital cardiac surgery including bleeding, tamponade, and low cardiac output.

  2. The resident should be able to demonstrate proficiency in cardiothoracic surgical skills including:

    a. Sternotomy and thoracotomy approaches, and incision closure in pediatric patients.

    b. Resternotomy and rethoracotomy in adult congenital cardiac surgical patients.

    c. Cannulation for cardiopulmonary bypass in pediatric patients.
d. Patent ductus arteriosus, coarctation repair, atrial and ventricular septal defect repair as primary surgeon under supervision.

- **Medical Knowledge**

Residents should be able to demonstrate:

a. A detailed understanding of current consensus guideline indications for congenital cardiac surgery and adjuncts including pharmacotherapeutic and percutaneous interventions.

b. A comprehensive knowledge of normal and pathologic conditions of both cardiovascular structures including congenital and acquired lesions.

c. In addition, the ability to establish a precise diagnosis, an essential step toward proper therapy, requires familiarity with diagnostic procedures such as cardiac catheterization, angiography, electrocardiography, echocardiography, and imaging techniques.

- **Practice Based Learning & Improvement**

The resident will:

a. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.

b. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.

c. Actively participate, as feasible, in retrospective studies to examine practice patterns in the institution.

- **Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with pediatric patients and their families regarding surgical procedures and medical status of the patient.

b. Participate actively in the process of obtaining informed consent.

c. Inform patients and their families of the risks and benefits of the procedure.

d. Interact with hospital staff, peers and attending in a collegial, professional manner.

e. Actively participate in the education of medical student and junior residents.

f. Participate in discussions and resolution of ethical issues that affect patient care.

g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.
e. Professionalism

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

• Systems Based Practice

The resident will:

a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.

Year 5 Advanced Adult Cardiac Surgery Rotation

Time frame: One year in the fifth year

The fifth year is designed to enable residents to develop proficiency in key adult cardiac operations, as well as clinical leadership skills. The entire year is spent in adult cardiac surgery, as Chief Resident, working in the Valve Surgery Program with the Program Director, Dr. David H. Adams and Dr. Paul Stelzer and in the Heart Failure Surgery Program with Dr. Anelechi Anyanwu

The primary objectives of the fifth year are to:

1. Progressively acquire, under supervision, the operative skills to perform the complex aspects of adult cardiac surgery including complex valve surgery (mitral valve repair, aortic root reconstruction, reoperations), complex coronary surgery (diffuse disease, reoperations), thoracic aortic surgery including stent grafting, thoracic transplantation and mechanical assistance.
2. Develop the interpersonal and professional skills necessary to be a practicing thoracic surgeon particularly outcomes audit, team leadership, and responsibility.

- **Patient Care**

As Chief Resident the fifth year resident is responsible for running the adult cardiac surgery service and overseeing administrative issues involving all fellows and residents. The Chief Resident works closely with Dr. David H. Adams, Chairman of Cardiothoracic Surgery and other members of the faculty to assure the service provides the highest level of care to all patients. By the end of this rotation the chief resident will have achieved the following goals and objectives:

a. Developed the skills to effectively supervise morning and evening rounds on all patients on the service including the cardiothoracic intensive care unit reviewing the interval events with the team and developing a care plan.

b. Liaise efficiently with the attending surgeons and if appropriate with other physicians and consultants involved in the patient’s care taking primary responsibility for all patient care decisions but working under the direct supervision of the attending surgeon.

c. Reviewing, along with the other residents and fellows, all preoperative patients (including imaging studies, functional tests, etc.) with the attending surgeon and together develop a pre- and intra-operative plan.

d. Performing cardiac surgical consults under the supervision of the attending surgeon.

e. The Chief Resident is responsible for assigning cases and selects his own cases to assure broad exposure to complex cardiac surgical cases. In the operating room the chief resident is allowed to perform as much of the technical manipulations of the procedure as possible, commensurate with his skill and progress. Typically, by the end of the year the chief resident should be performing all of the essential portions of the operation even in the most complex of cases, including performing most transplant and mechanical assistance cases. The Chief Resident will typically perform most organ harvests and participate in implantations.

- **Knowledge**

By the end of this rotation the Chief Resident should:
a. Develop a comprehensive knowledge base of the pathophysiologic and clinical processes in patients with complex adult cardiovascular diseases including thoracic aortic disease, end-stage heart failure and complex coronary and valvular disease.
b. Develop a detailed, expert understanding of the selection and timing of operative intervention in complex adult cardiovascular disease focusing on an evidence-based approach using the most current literature.
c. Specifically learn the processes for selection of patients and organs in thoracic transplantation and mechanical assistance.
d. Display an in depth understanding of critical appraisal of the literature, and principals of study design, data analysis and scientific writing.
e. Organize the clinical material and present at weekly multidisciplinary thoracic clinical conference and morbidity and mortality conference.

**Practice Based Learning & Improvement**

The chief resident will:

d. Continue to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.
e. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.
f. Actively participate, as feasible, in retrospective studies to examine practice patterns in the institution.

**Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.
b. Participate actively in the process of obtaining informed consent.
c. Inform patients and their families of the risks and benefits of the procedure.
d. Interact with hospital staff, peers and attending in a collegial, professional manner.
e. Actively participate in the education of medical student and junior residents.
f. Participate in discussions and resolution of ethical issues that affect patient care.
g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.
Professionalism

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

Systems Based Practice

The resident will:

a. Optimize career opportunities by interfacing with referring physicians, networking, and gaining understanding of practice building and management. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.

Year 6 Advanced Thoracic Surgery Rotation

Time frame: Six months in the final year at The Mount Sinai Medical Center

This final year rotation, in which they spend six months as Thoracic Chief Resident, is designed to enable residents to develop proficiency in general thoracic surgery. During this introductory 6 month rotation the cardiothoracic resident will function as the thoracic resident. They will usually be the sole ACGME resident on the thoracic service during this time, unless the 3rd year ACGME resident elects to pursue the thorascoscopic basic skills elective on the service. In this way they will have unrestricted exposure to a wide range of complex surgical conditions and procedures, providing excellent clinical and operative experience.

Patient Care
As Chief Thoracic Resident the sixth year resident is responsible for running the thoracic surgery service and overseeing administrative issues involving all thoracic fellows and residents. The Chief Resident works closely the Chief of Thoracic Surgery and other members of the faculty to assure the service provides the highest level of care to all patients. By the end of this rotation the chief resident will have achieved the following goals and objectives:

a. Proficiency in the preoperative assessment, operative management and post-operative care of patients undergoing general thoracic surgical procedures; including optimization of cardiopulmonary status, oncologic staging, neoadjuvant therapy, and operative techniques.
b. Progressively acquire, under supervision, the operative skills to perform the complex aspects of thoracic surgery including esophageal resection, re-operative pulmonary resection and video-assisted major thoracic procedures.

• Medical Knowledge
  a. Acquire a detailed knowledge of the fundamental pathophysiologic and clinical processes underlying the diseases of the non-cardiovascular, thoracic organs and the physiologic basis of the spectrum of general thoracic surgical procedures
  b. Gain proficiency in interpretation of the various diagnostic modalities in this field including conventional radiography, CT and MR scans, PET scans, ultrasonography, esophageal manometry and pH testing, pulmonary function tests, etc.
  c. Provide selection and timing of operative intervention in thoracic disease focusing on an evidence-based approach using the most current literature.
  d. Acquire a detailed knowledge of their chosen subspecialty area.

• Practice Based Learning & Improvement
  The chief thoracic resident will:
  a. Initiate, design and complete clinical studies either from the thoracic surgery database or from prospective data.
  b. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.
  c. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.
Interpersonal & Communication Skills

The chief thoracic resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.
b. Participate actively in the process of obtaining informed consent.
c. Inform patients and their families of the risks and benefits of the procedure.
d. Interact with hospital staff, peers and attending in a collegial, professional manner.
e. Actively participate in the education of medical student and junior residents.
f. Participate in discussions and resolution of ethical issues that affect patient care.
g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.

Professionalism

The chief thoracic resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

Systems Based Practice

The chief thoracic resident will:

a. Optimize career opportunities by interfacing with referring physicians, networking, and gaining understanding of practice building and management. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
Year 6 Electives

Time frame: Six months in the final year at The Mount Sinai Medical Center

These electives are designed to allow residents to develop subspecialist skills in an area of particular interest, or consolidate core skills if evaluations suggest that is more appropriate to ensure the graduating resident is ready for independent practice. There is an opportunity on a case-by-case basis to explore the option of rotations at outside centers of excellence. The following electives are available within the Department of Cardiothoracic Surgery at The Mount Sinai Medical Center. For the sake of avoiding repetition the goals and objectives for each rotation relating to Practice Based Learning and Improvement, Interpersonal and Communication Skills, Systems Based practice, and Professionalism will not be repeated in the descriptions of these electives as they are the same as those described for final year thoracic surgery above.

Elective option 1: Advanced Mitral Reconstruction

This six month elective is designed to enable residents to develop proficiency in complex mitral valve reconstruction. Over 300 such procedures are carried out each year at The Mount Sinai Medical Center, which is one of the highest volume mitral centers in the United States and home to faculty with internationally recognized expertise in this area. The resident will work exclusively with the Chairman during this rotation, attending his clinics and performing or assisting on the second and fourth mitral valve cases on his lists (the first and third will normally be carried out by the Chief cardiac resident). There is the expectation that the resident will complete a clinical outcomes research project in this area during this elective.

- **Patient Care**
  
  By the end of this rotation the resident will have achieved the following goals and objectives:

  a. Proficiency in the preoperative assessment and counseling of patients undergoing mitral and tricuspid surgery, including ability to predict feasibility and complexity of valve repair, and a thorough grasp of current consensus guidelines and the relevant literature on the role of surgery in management of mitral valve disease.
b. Progressively acquire, under supervision, the operative skills to perform the complex of mitral and tricuspid valve reconstruction, including surgery for complex degenerative, rheumatic and ischemic disease, endocarditis and re-operative procedures.

c. Proficiency in the prevention, diagnosis and management of complications associated with mitral valve surgery including residual or recurrent regurgitation, functional stenosis, systolic anterior motion, and endocarditis.

**Medical Knowledge**

a. Acquire a detailed knowledge of the fundamental pathophysiologic and clinical processes underlying the diseases of mitral and tricuspid valve.

b. Gain proficiency in interpretation of the various diagnostic modalities in this field particularly transthoracic and transesophageal echocardiography.

c. Provide selection and timing of operative intervention in mitral disease focusing on an evidence-based approach using the most current literature.

**Elective option 2: Advanced Aortic Surgery**

This six month elective is designed to enable residents to develop proficiency in complex aortic surgery. Over 300 such procedures are carried out each year at The Mount Sinai Medical Center, which is home to faculty with internationally recognized expertise in this area. The resident will work exclusively Dr. Griepp, Dr. Stelzer and Dr. Diluozzo during this rotation, attending their clinics and performing or assisting on their operating lists. There is the expectation that the resident will complete a clinical outcomes or laboratory based research project in this area during this elective.

**Patient Care**

By the end of this rotation the resident will have achieved the following goals and objectives:

a. Proficiency in the preoperative assessment and counseling of patients undergoing aortic valve reconstruction and thoracoabdominal aortic surgery, including ability to plan such surgery, and a comprehensive grasp of current consensus
guidelines and the relevant literature on the role of surgery in management of aortic disease.

b. Progressively acquire, under supervision, the operative skills to perform aortic valve reconstruction and thoracoabdominal aortic surgery, including surgery for aneurysms and dissections of the ascending aortic arch and thoracoabdominal aorta, and hybrid procedures incorporating endovascular approaches.

c. Proficiency in the prevention, diagnosis and management of complications associated with aortic surgery paraplegia, stroke, pseudoaneurysm formation, disease progression and endoleaks,

• Medical Knowledge

a. Acquire a detailed knowledge of the fundamental pathophysiologic and clinical processes underlying the diseases of aorta and aortic valve.

b. Gain proficiency in interpretation of the various diagnostic modalities in this field particularly transthoracic and transesophageal echocardiography, computerized tomography, magnetic resonance imaging and angiography.

c. Provide selection and timing of operative intervention in aortic disease focusing on an evidence-based approach using the most current literature.

Elective option 1: Advanced General Thoracic Surgery

This six month elective is designed to enable residents planning to practice as pure general thoracic surgeons the opportunity to consolidate the thoracic skills gained in 18 months of thoracic practice during their six year program, bringing the total of thoracic experience to 2 years. The resident will work exclusively with the Chief of Thoracic Surgery during this rotation, attending his clinics and performing or assisting on all cases. There is the expectation that the resident will complete a clinical outcomes research project in this area during this elective.

• Patient Care

By the end of this rotation the resident will have achieved the following goals and objectives:

a. Proficiency in the preoperative assessment and counseling of patients undergoing thoracic surgery, including ability to predict
feasibility and complexity of lung and esophageal resection, options for esophageal reconstruction, and a thorough grasp of current consensus guidelines and the relevant literature on the role of surgery in management of mitral valve disease.

b. Progressively acquire, under supervision, the operative skills to perform complex lung and esophageal resection, including sleeve resection, tracheal resection, pleuropneumonectomy, and lung transplantation.

c. Proficiency in the prevention, diagnosis and management of complications associated with complex general thoracic surgery.

- Medical Knowledge

  a. Acquire a detailed knowledge of the fundamental pathophysiologic and clinical processes underlying the clinical presentation of thoracic malignancy.

  b. Gain proficiency in interpretation of the various diagnostic modalities in this field particularly nuclear imaging, computerized tomography, endoscopic ultrasound and functional studies such as esophageal pH monitoring.

  c. Provide selection and timing of operative intervention in thoracic malignancy disease focusing on an evidence-based approach using the most current literature.